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APR 27 1936
PLANT INDUSTRY

WEEKLY STATION REPORTS

OF THE DIVISION OF

DRY LAND AGRICULTURE

BUREAU OF PLANT INDUSTRY

U. S. DEPARTMENT OF AGRICULTURE

MAR 1936

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REPORT FOR THE MONTH OF MARCH, 1936.

HAVRE:

The winter of 1935-36 was characterized by unusual weather variations during certain portions of the season. A summary for the months of November through March, based on station records is presented below:

	Monthly Data					Seasonal	Normal
	Nov.	Dec.	Jan.	Feb.	Mar.	Nov.-Mar.	1880-1934*
Temperatures:							
Mean	24°	25°	9°	-14°	28°	14.4°	21.8°
Maximum	34	36	19	-4	38	24.7	32.0
Minimum	13	15	-2	-25	19	4.0	11.4
Days zero or lower	5	2	21	28	4	60	----
Days 32° or higher	21	22	11	2	23	79	----
Precipitation: Inches							
Snowfall	3.9	3.9	9.8	15.8	8.8	42.2	28.5
Precipitation**	.30	.10	.40	.64	.37	1.81	2.87

* U. S. Weather Bureau, Havre, Montana. ** Melted snow, difficult to catch all snowfall under exposed conditions at the station.

Subzero temperatures occurred as early as October 29, following which mild to moderate winter weather continued until January 12, with only occasional temperatures below zero. From January 13 to February 28, readings of zero or lower occurred on 44 of the 47 days. The mean temperature for February of -14.3° was an all time low, the next lowest mean for any previous month in 56 years of record being -13.3° in January 1916. Minimum temperatures of -35° or lower prevailed on 9 days, the absolute minimum being -48° on February 15.

Accumulated snow melted with extraordinary rapidity during chinook winds on February 29 and March 1, resulting in local floods from water courses originating in the Bear Paw mountains. Lowlands were inundated, and cattle in a number of experimental feeding lots along Beaver Creek had to be moved to higher ground.

A continuation of mild, drying weather permitted field work to begin March 16, disking and harrowing of fall plowing and some miscellaneous spring plowing being done before another change of weather sent temperatures well below zero during the last four days of March. At present fallowed land is somewhat lacking in soil moisture, but stubble fields have a comparatively good supply.

Some livestock losses, attributed to lack of water during the prolonged cold spell in which streams and springs "froze dry", were reported from various localities in northern Montana.

JUDITH BASIN:

The month of March was dry and windy with mean temperatures slightly below normal. The snow remaining on the ground at the beginning of the month melted rapidly and had all disappeared by March 3. Over three-fourths of the moisture from the February snow was lost by run-off.

The winter wheat appeared to be alive and in fair condition when the snow cover disappeared the first of the month but has suffered considerable deterioration since that time. Alternate freezing and thawing the first half of the month caused the surface soil to crack and check badly. High winds with considerable soil blowing also damaged the young plants. A light fall of snow at the close of the month has helped conditions some, but all the winter wheat is in a very weak condition, and it seems that considerable reseeding of fallow fields will be necessary.

Temperatures dropped the last week of the month to below zero, and a minimum of -20° on March 29 was the lowest ever recorded so late in the season. There was about 2 inches of snow on the ground at the close of the month.

Maximum temperature, 58°; minimum, -20°; precipitation, 0.22 inch.

HUNTLEY:

Except for the last few days of the month, temperatures were comparatively mild during March, and snow remaining on the ground at the end of February melted rapidly with a high percentage of run-off. Fields dried quickly, and by the middle of the month spring tillage operations were under way on most farms in the community.

Work on the experimental plots was begun March 18. Weeds were raked off the "weed protection" plots in the crested wheatgrass planting experiments, and some early seeding of crested wheatgrass was done. Plowing, disking, and harrowing was begun on the rotation plots and in the miscellaneous experiments. There appeared to be a wide variation in the moisture content of the plots. On the higher parts of the fields the plow often went through the moist stratum of soil and turned up dry earth. In the lower areas where run-off water collected, the soil in places was too wet to work well. Many of the fall-plowed plots which went into the winter in a very cloddy condition did not absorb enough moisture to soak up the clods.

Most of the winter wheat that emerged last fall appears to be very weak or is dead. As only a very small percentage of the fall-sown wheat came up before winter, this loss will not be great. Much of the winter wheat and rye is coming up now, but the stands to date are very thin and spotted. The ground is yet too cold to encourage much plant growth, and grass and alfalfa have made little progress.

No measurable precipitation occurred during March until the 28th when a light fall of snow was received. Snow fell on two following days, and the temperature dropped to a minimum of -7°, halting field work for the time being. At the end of the month the ground is covered with snow to a depth of 2 inches.

Maximum temperature, 63°; minimum, -7°; precipitation, 0.38 inch.

DICKINSON:

During the first three weeks the weather was mild and most of the snow melted. By the 20th most of the fields were bare, except where the snow had drifted. Most of the frost was out of the ground on stubble land. In stubble the soil was wet less than a foot deep. Much lower temperature prevailed during the last week, with a minimum of -1° on the 31st. A few rows of grass were planted in the nursery on March 17, and two rows of cotoneaster seed were planted in the garden about the same time.

Visitors during the month included: F. L. Duley, Manhattan, Kans., in charge of the research program, S. C. S., in the Northern Great Plains; A. D. McKinnon, Bismarck, State Coordinator of S. C. S.; H. L. Alexander and G. L. Weber, Mandan, S. C. S.; and W. L. Caver, St. Paul, statistician, Farm Credit Administration.

Maximum temperature, 60°; minimum, -1°; precipitation, 0.59 inch.

MANDAN:

The month of March was cool, but the mean temperature was slightly above normal. Thawing started early in the month, but this was not excessive, with the exception of 2 or 3 days. The snow melted slowly, and a large part of the water soaked into the soil. Remnants of snowdrifts 2 or 3 feet deep remained on the station grounds at the end of the month. Snowfall during the month amounted to 11.75 inches, making 1.12 inches of precipitation. A blizzard occurred on one day.

The Missouri and Heart Rivers broke up during the month and went out without serious trouble.

Maximum temperature, 56°; minimum, -1°; precipitation, 1.12 inches.

Visitors to the station during the month included: H. M. Benedict, Forage Crops and Diseases; Arnold J. King, Agricultural Economics; O. R. Mathews, Dry Land Agriculture; F. L. Duley, Soil Conservation Service; M. N. Hoover, and Otto Brown, Soil Conservation Nurseries.

BELLE FOURCHE:

Raw, blustery weather prevailed most of March, but temperatures were comparatively moderate until the last week. A severe cold wave of midwinter proportions occurred at the close of the month, subzero temperatures being recorded March 29 and 30. Snow was received almost daily from March 22 to 31, but in no instance was the amount sufficient to improve materially soil moisture conditions. The total precipitation for March was 0.17 inch less than the 28-year average for the month. Numerous strong winds blew most of the snow off cultivated fields, and rapidly dried the surface soil. A high wind on March 28 caused considerable drifting of soil, and duckfooting of corn stubble and fallow land was necessary to prevent soil blowing.

Moisture from the winter snows penetrated to a depth of 7 to 10 inches on grain stubble land, and 1 to 6 inches on corn ground. Owing to excessive drifting of snow in January and February, there is wide variation in the depth of moisture on all cultural treatments.

Approximately one-third of the land on corn stubble plots plowed for small grain March 27 was nearly as dry as in the fall and plowed up in large hard lumps, but all grain stubble land plowed in excellent condition.

Much of the fall grain germinated during March, and some of it was beginning to emerge before the cold weather late in the month stopped growth, but there were areas on the corn and sorgo stubble plots in which the soil was too dry to permit germination. Bromegrass and other crops, with the exception of crested wheatgrass, have shown no appreciable indication of resuming growth.

Maximum temperature, 63°; minimum, -9°; precipitation, 0.59 inch.

SHERIDAN:

Average temperatures still continue to run by extremes. The first two-thirds of the month was the second warmest recorded on the station, and for the last 10 days the mean temperature averaged the lowest yet recorded, with the lowest minimum temperature yet recorded for this section during the last half of March occurring on the 30th.

Considerable field work and some seeding was done over this section during the first three weeks of the month. Early broadcast seedings of sweetclover were made on the 5th. A light broadcast seeding of bromegrass was made where last year's seedings appeared to have killed out largely during the summer. A very light stand of bromegrass appeared to be coming from last year's seeding. A small block on the south end of field G, including a sandy hill and a ravine, was sown broadcast to crested wheatgrass. A date of seeding small grain was sown on the 20th.

Weather conditions changed abruptly on the evening of the 21st, with rain changing to snow furnishing about 0.60 inch of water. Light snow again fell over the 28th and 29th and from the evening of the 30th to date (April 1) accompanied by extreme low temperatures for this season of the year.

The condition of winter wheat is uncertain, but examination of several seedings indicates that much of that which failed to emerge in the fall may be winterkilled. That which emerged appears to be in fair condition, but there was little or no growth during the warm weather. A random sampling made on land cropped last year showed moisture to a depth of about 1 foot before the snow of the 21st. The month ended with about a 6-inch cover laying fairly evenly over most land, although there was a little drifting.

Pigs farrowed during the warm weather with fair litters and but small losses to date. Lambing began about the 20th and continues slowly with no losses so far because of the cold weather.

Maximum temperature, 58°; minimum, -17°; precipitation, 1.38 inches.
Mean temperature, 31°.

ARCHER:

During the forepart of March the weather was mild with considerable wind, but serious soil blowing did not occur. The last nine days of the month were unsettled and very cold. During this period snow flurries were common. The light snow served as a partial protection to winter cereals, which are in a critical condition.

The dry weather and severe cold during February caused serious injury to the winter wheat in many fields. Considerable new growth had taken place in March, but the plants will again be weakened by the zero temperatures of the past nine days. It is probable that there will be considerable reseeding.

In lower altitudes considerable field work has been accomplished. At the station everything is in readiness to begin spring work as soon as the weather permits.

Livestock are in good condition, and generally sufficient feed is available to care for them under average conditions.

Maximum temperature, 63°; minimum, -1°; precipitation, 0.47 inch.

NORTH PLATTE:

March was slightly warmer and drier than normal. At the table station, temperatures ranged from 71° on the 9th to 10° on the 31st. The mean of 38.1° was 1.5° above normal. There was no measurable precipitation until the 23rd. Precipitation on five days late in the month, all as snow, totaled 0.57 inch, which is 66 percent of the March normal. A very unusual low temperature record was made after the close of the month. A minimum of -4° on the night of April 1 is 16° below the previous low for April. It is still too soon to determine the damage done to tree buds. Fields were protected by snow, and damage to grain is probably slight. Dry weather during most of the winter and some damage from soil blowing has left most fall seed grain in the western half of the State in poor condition. Abandonment will probably be greater than normal, even with favorable conditions from this date on. Considerable spring grain has been seeded in that area, but dry soil and low temperatures have delayed germination so that injury from freezing is not looked for.

AKRON:

March opened with snow flurries on the 1st, 3rd, and 4th, amounting in each case to trace precipitations. Weather then remained open until the 18th, when 0.17 inch of precipitation was received. This was the beginning of a stormy weather period extending to the end of the month. Precipitation was recorded on the 23rd, 25th, and 31st. All this precipitation was in the form of snow which was only fairly well distributed. The total precipitation for the month was 0.64 inch. The term average is 0.78 inch.

Temperature was generally mild. The coldest was 8° on the 31st. The highest was 75° on the 10th.

Wind movement was moderate. There were only two days of moderately 'dirty' weather and these did not accompany the highest

24-hour average wind velocities. These dirty days were the 10th with an average velocity of 8.8 miles per hour, and the 14th with an average velocity of 7.5 miles per hour. The highest 24-hour average wind velocities were 10.8 and 12.4 miles per hour on the 15th and 23rd, respectively.

Field work was started on the rotation block on the 11th and completed without any interruption. Peas and barley were seeded on the 16th, spring wheat on the 17th, and oats on the 18th. On that night there was snowfall amounting to 0.17 inch of precipitation. This seeding was accomplished in ground in most cases too dry to germinate the seed.

Winter wheat attempted to start active growth early in March, but there appeared to be a shortage of surface soil moisture. Snowfall the last few days of March prevented taking winter wheat condition notes for this report. It is expected that the bulk of the station winter wheat plantings have come through the winter in satisfactory condition. The recent moisture, though light, will be very beneficial in correcting the dry condition of the surface soils.

Maximum temperature, 75°; minimum, 8°; precipitation, 0.64 inch.

COLBY.

March was a warm, dry, and generally pleasant month. The wind velocity was about normal. It was dusty with more or less soil blowing on 15 days, mostly during the last half of the month. On 8 of these days the air was filled with dust and there was damaging soil blowing over a period of several hours so that they could be classed as days of moderately severe dust storms. About half of these occurred during the night and were followed by calm and clear days for the most part. Except on these 8 days soil blowing occurred only at intervals and lasted over short periods so that not much serious damage was done. There was practically no damaging soil movement at this station. Throughout this county, however, there are scattered areas where soil blowing has been very severe and damaging to wheat on a number of fields. One of the worst areas in the county covers several sections about a mile northwest from the station.

Winter wheat is spotted, ranging from poor to good. At this station the stand is rather poor, showing, in addition to poor emergence last fall, evidence of some winter killing. It has made practically no growth during the warm weather which prevailed most of the month. It has not greened up enough for the plots to appear green at a distance. The upper 4 inches of the soil are dry, but the wheat appears to be rooted in moist soil on the continuously cropped plots and in wet soil on the fallow plots.

Over this county there are wide areas where many fields have greened up so that they appear very promising. Most of it is barely showing above the drill ridges and none of it is over 3 or 4 inches high. Some of this good wheat has been damaged by soil blowing over it from bare fields. The damage from soil blowing is not much above normal, however.

The spring small grains have not been seeded as yet. The ground was prepared early in the month, but seeding was delayed until moisture fell or conditions became more favorable for growth of the young plants should they come up. It was planned to start seeding today, but the ground was frozen and covered with snow which fell during the afternoon yesterday, March 31, and up until late this afternoon.

Maximum temperature, 80°; minimum, 13°; precipitation, 0.21 inch; snow, 2 inches.

HAYS:

The first ten days of March weather was generally calm, mild and fine except for one dusty day. The temperatures ranged between 81° and 22°. By the 3rd the frost was out of the ground to plowing depth, and by the 10th the frost was all out of the ground. From the 10th to the end of the month temperatures ranged between 71° and 14°. Moderate to heavy winds were frequent for short periods, seldom lasting more than 12 hours, variable in direction. Ten days could be designated as "dusty" the air being partially laden with dust and visibility for short periods reduced to from 1 to 3 miles. In addition to these "dusty" days, four days, the 22nd, 23rd, 25th and 26th were noted for real dust storms, not so severe as, but remindful of those storms of a year ago. For a few hours each day visibility was reduced to one-fourth mile. The most severe storm occurred in the afternoon of the 23rd, when the air was heavily laden with red dust from the south. The sky was reddened by the dust and visibility was reduced to 10 rods or less for two hours. All city street lamps were lighted and driving on the road was extremely dangerous. During all the storms of this month most of the dust came from a distance of 50 or more miles. Soil drifting in this vicinity occurred only on small spots, for most part on feed land. In some cases the drifting spread to adjoining wheat fields. The drifting in this locality could have been prevented by a small amount of timely tillage.

The two months continuous freeze of January-February, resulted in no ill effects upon the wheat. It commenced growing out of its brown coat as soon as the frost left the first few inches of soil. Despite the unfavorable overhead conditions during the last two-thirds of the month there was sufficient warm weather and moisture in the soil to maintain a healthy growth except on the spots that were damaged by the soil drifting. On fallow the growth covers 30 to 45 percent of the ground, and on cropped land from 15 to 30 percent. There is sufficient growth to furnish fair to excellent pasture. Soil moisture determinations indicate there was little loss of moisture from the soil during the winter, and that there is still sufficient moisture in the upper 2 feet of soil to carry the wheat for some time without rain. However, because of the rapid and tender growth of wheat made during the last few weeks, the possibility of injury by a late freeze is not entirely past.

Spring plowing and necessary surface tillage preparatory to seeding small grain crops were completed March 3 and 4. Barley, oats, spring wheat, and field peas were seeded March 18.

Although dry at the surface, the soil is in excellent condition for tillage work. All methods of preparation resulted in good seed beds and there appears to be sufficient moisture to produce good germination, unless the continuous dry weather dries the freshly worked soil to the depth of the seed.

Apricot trees in full bloom, Chinese elm and some other trees beginning to develop leaves, grape and rose buds swelling, rhubarb and peonies peeping through the ground, weeds beginning to show above the ground; these notes are given only to indicate the degree to which winter is breaking and spring is approaching.

Maximum temperature, 81°; minimum, 14°; precipitation, 0.11 inch; snow, 1 inch.

GARDEN CITY:

March was not excessively windy or cold, but the feeble winter wheat plants did not grow much during the month due to continued buffeting by dry wind-blown silt and very fine sand particles.

A trip to Hays and Colby stations revealed some very good wheat east of Kalvesta and Oakley, but very little wheat that even gives a field a green appearance west of these two towns. Both the Colby and Garden City stations appear only a matter of several miles west of territory where wheat shows good promise.

Wheat on the station came up about the first of March and rapidly grew large enough to give the ground a green appearance. It is no greener now than three weeks ago, although it is apparently all alive yet.

Dust storms have been numerous but not nearly so severe as last year. This is chiefly because the land north of this county is not in condition to blow. Locally soil movement is at least as severe as last year. Towns to the south and west, especially Liberal and Ulysses, Kans., and Springfield and Lamar, Colo., have reported the worst "dusters" on record during the past month.

This region continues less than 50 per cent of average precipitation with 4.92 inches in the past ten months. This is 0.01 inch less than for the same period a year ago. During the past 27 months 16.78 inches of precipitation were received. Prior to this period the average was 18.59 inches per annum. The average is now 17.86 inches for a 28-year record.

Maximum temperature, 79°; minimum, 18°; precipitation, 0.13 inch.

TUCUMCARI:

The past two months have been as unfavorable in a climatic sense as the corresponding months in 1934 or 1935. January 1936 was apparently a harbinger of improving conditions, with several light snows. February was windy, with only 0.07 inch precipitation. March had no precipitation but was one of the windiest months on record. Soil blowing has been more difficult to prevent than in either 1934 or 1935. False hopes aroused by the favorable January have been emphatically shattered.

Temperatures for March were unusually high, with fruit trees in bloom the past week. Apparently no blooms were injured by recent frosts.

Work has included planting and watering trees and continual work to lessen the damage of soil movement. Under such climatic conditions, little seems to be accomplished.

Wheat on the plains received good fall moisture and looked satisfactory six weeks ago. It has been buffeted and beaten by wind and blowing sand so severely that many fields are past saving; others still offer prospects of a crop if conditions improve soon. Farmers row crop fields where listing has been performed are in most cases blown level. Only surface cultivation has been attempted to date on the station, but further work of this sort will be quite ineffective.

Maximum temperature, 79°; minimum, 26°; precipitation, none.

DALHART:

With only a trace of precipitation and rather frequent high winds this section of the Panhandle continued to have severe soil movement throughout March. There were not as many dust storms as in March 1935, but there was practically as many fields subject to blowing. Actually the station suffered worse than in the preceding year. This is due chiefly to damage from adjacent farm land. The station fields were held in place fairly satisfactorily, but there was considerable scouring action from the hard-driven sands. The west fence is completely covered with blown sand. Rye and wheat have stood the extreme punishment remarkably well, but both because of the sand punishment and the depleted soil moisture neither crop can survive much longer. Apparently the winds this spring have stayed on the ground more than in 1935.

Where ample moisture was received last fall farmers report the wheat to be in good condition. Most of the wheat is now in that precarious state where moisture is needed at once for a satisfactory yield.

Maximum temperature, 77°; minimum, 18° (on the morning of April 1); precipitation, trace.

BIG SPRING:

March temperatures as a whole were somewhat above normal. In fact there was only one morning during the month when the minimum reached the freezing point. If a killing frost is not received during April, it is probable that a good fruit crop will be started at least.

A hard, dashing rain consisting of 1.53 inches was received on March 2 and another of 0.41 inch on the 8th, these soaked up the station soil at the time, but the surface is getting very dry at this writing. Although there have been no hard blows which caused a lot of soil movement, wind velocity has been consistently higher than normal during the month. Winds have been just strong enough to make working out of doors very disagreeable when they were in progress.

Eighty acres of milo and sumac land was relisted during the month. Other work has consisted of roughing up plots and other

increase land with harrow and springtooth to prevent blowing of soil. Maximum temperature, 84°; minimum, 32°; precipitation, 1.94 inches.

LAWTON:

During the past 117 days, December 5 to March 31, no precipitation of any consequence has been received. During that period 8 showers produced a total of 0.39 inch precipitation, and 4 of these showers were recorded the latter part of December. The total precipitation from January 1 to date amounts to 0.15 inch, leaving a deficiency of 3.66 inches.

Periods of high wind velocity during the daylight hours were frequent in March, and on several dates the sky was dimmed with dust. The maximum temperatures ranged from 61° to 85° and the minimum temperatures from 32° to 56°. The average temperature for the month was slightly above normal. A minimum temperature of 32° on the 26th did not injure truck crops or fruit trees that were in bloom. Fruit trees and early spring flowering shrubs bloomed very heavily this year.

Wheat, winter oats, and winter barley grew very rapidly during the first 20 days in March, but the lack of moisture has checked growth very decidedly the past 10 days. Winter oats are probably showing the greatest need of moisture at the present time. Although these crops have withstood the dry weather remarkably well, they are rapidly approaching a critical period where injury and deterioration will be fast and permanent. Stands of spring oats are extremely spotted, and growth has been retarded by the lack of moisture. In the rate and date-of-seeding test, stands range from 20 to 90 percent, and in the variety test the range in stand extends from 10 to 75 percent.

Winterkilling in the winter oats varieties was estimated as follows:

Variety	C. I. No.	Per cent winterkilled
Fulghum	2498	2.0
Nortex	2382	50.0
Custis	2041	2.0
Lee	3026	2.0
Coker 32-1		25.0
Coker 33-19		5 to 10
Coker 33-47		1 to 2

No winter injury was observed in any of the winter barley seedings. Corn, planted on the rotation plots March 17, is emerging to thin, uneven stands at present.

Spring plowing of rotation plots, except plots to be fallowed, was done March 10 - 13. This is earlier than usual, but the work was done with the idea of getting the seed beds in shape to receive and retain as much spring moisture as possible before planting.

Spring growth of native grasses and such legumes as alfalfa and sweet clover has been greatly retarded by the lack of moisture. Windy weather and dry surface soils have also prevented the seeding of any alfalfa or sweet clover.

WOODWARD:

Condition of wheat in Northwest Oklahoma is coming to be thought of as serious. Spots in fields are developing that apparently show lack of moisture. However, soil samples on the station show good moisture in the 4th foot on continuous cropping and in the 6th foot on fallow. Weather has been unseasonably warm through March, and wheat has apparently been unable to reach down for moisture as rapidly as it is needed. April rains would revive it in a wonderful way.

There have been a number of dust storms here during the past two weeks, but in only a few cases has blowing moved the soil as far east as this. The dust has come on high winds from further west and settled here. There has been no blowing on the station. In fact, control of blowing has been rather easier than usual, because of moisture in the soil from last fall's rains. At present, of course, a good cover of wheat has been established on much of it, so blowing is impossible.

The cold weather during the winter killed most of the peach buds, and the temperature of 15° on the night of April 1 finished the scattered blossoms and killed all the apricots that had set. It also killed all the buds of spirea Vanhouttei, which would have given us April snowbanks in ten days. We have had a nice showing of flowering peaches and plums, spirea arguta, hyacinths, early tulips and iris, although their beauty has been dimmed by settling dust. Daphne cneorum is our most satisfactory spring bloomer. It is low and compact, so can be easily covered during the more severe freezes and withstands the light ones. It has made a bank of fragrant, rose colored bloom for two weeks already and bids fair to continue for a week or two.

Station work during March consisted principally of pruning trees and planting nursery stock, with a limited amount of disking, cultivating, and repairing roads being accomplished.

Maximum temperature, 80°; minimum, 24°; precipitation, trace.

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APR 15 1936
BUREAU OF PLANT INDUSTRY